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NOTES ON A COLLECTION
OF
COLD-BLOODED VERTEBRATES
FROM ONTARIO.

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NOTES ON A COLLECTION OF COLD-BLOODED VERTEBRATES FROM ONTARIO.

BY S. E. MEEK AND H. W. CLARK.

The following paper is based on a collection of fishes, batrachians and reptiles made by the senior author and Mr. L. V. Kenkel in Ontario the last three weeks of June, 1900. The collection of batrachians and reptiles is not large. It was too early in the season and too cool for them to be out in any considerable numbers. The collection of fishes is more complete, in fact it is the only collection of any importance ever made in this region, and it gives us a fair idea of the fish fauna of Ontario and extends our knowledge of the geographical distribution of several of the smaller fishes.

Northern Ontario is exceedingly well watered: its numerous lakes and streams are so connected that altogether they form practically one great drainage system. The larger streams usually have broad deep channels and flow with a gentle current. The changes in level are made by falls, cascades and rapids, many of which fishes cannot ascend. Our study of the fishes of Ontario indicates that altitude plays a considerable part in distribution. Gull Lake is about three-fourths of a mile from Muskoka Lake, but is 60 feet higher. The outlet of the former flows into the latter; it contains falls and cascades that fishes are unable to ascend. A whitefish, a herring (the species of which we do not know) and the wall-eyed pike (*Stizostedion vitreum*) are found in Muskoka Lake and not in Gull Lake. Of the small fishes the log perch (*Percina caprodes*) and the black-tailed shiner (*Notropis hudsonius*) were found by us in Muskoka and not in Gull Lake, though the latter lake was more extensively explored than the former. There is a fall of 18 feet at the head of the outlet of Muskoka Lake; the river then flows in a broad deep channel with a gentle current for about 4 miles to a second falls; there are other falls about the same distance farther down. The pickerel (*Lucius lucius*), the muskallunge (*Lucius masquinongy*) and the rock bass (*Ambloplites rupestris*) are found below the second and third falls

of the outlet, but none of these species have ever been taken in the outlet above the second falls or in either Muskoka or Gull lakes.

The yellow perch (*Perca flavescens*) is evidently the most widely distributed and most abundant fish in northern Ontario; next seems to be the pumpkin seed (*Eupomotis gibbosus*). There is near shores and in smaller streams a large number of minnows (*Cyprinidæ*). At Chapleau in the Hudson Bay drainage we found no minnows, though collecting was done where we would expect to find them; one species of darter (*Etheostoma boreale*) was found here.

The game fish laws of Ontario are very strict and well enforced. The object of these laws is to preserve the fishes in the smaller lakes for anglers, and to afford a certain amount of sport and recreation for people in our crowded cities who spend a portion of the summer in this region. At the present rate it will be many years before the small-mouthed black bass (*Micropterus dolomieu*) and the wall-eyed pike (*Stizostedion vitreum*) become scarce, if ever they do. The worst factors in the destruction of the large fishes of this region are the saw-mills and the cutting and rafting of timber in the streams; the extent of this destruction can be determined only by considerable study and extended observations. We doubt, though, if these causes will ever have any appreciable effect on the fish supply of this country. Ontario is doing well to protect her native game fishes, for the financial gain from the tourist on account of these will certainly be of greater importance to Ontario than the commercial value of these fishes, the taking of which would soon deplete her waters.

We have included in this paper a small collection of fishes made by the senior author in October, 1900, at Sault Ste. Marie, and the Lizard Islands in Lake Superior.

Our collections were made as follows:

Hawkestone: Lake Simcoe and a small stream which flows into the lake at this place.

Orillia: Couchiching Lake.

Gravenhurst: Gull Lake, and the upper part of its outlet.

Bala: Muskoka Lake, and a small stream near Bala.

Katrine: Magnetawan River, and a small lake near by.

Trout Creek: Trout Creek, a small rapid stream, tributary of South River, which flows into Lake Nipissing.

North Bay: Caught a few wall-eyed pike from wharf.

Chapleau: Mattagami River and the two lakes near by.

Sault Ste. Marie: The river and a small stream near the city.

Lizard Islands: Shore of the islands.

PISCES.

SILURIDÆ.

Ameiurus nebulosus (Le Sueur). Bullhead.

This species is common in Gull and Muskoka lakes. Very little attention is given to their capture on account of the abundance of better food fishes.

Ameiurus melas (Rafinesque). Bullhead.

This species is not usually distinguished from the former. It is even more abundant. Gull and Muskoka lakes.

CATOSTOMIDÆ.

Catostomus commersoni (Lacépède). Common Sucker.

Very abundant; the only species of sucker taken by us in Ontario. One specimen taken at Chapleau has 72 scales in the lateral line; head $4\frac{1}{3}$; depth $4\frac{1}{3}$; dorsal rays 11; longest dorsal ray $1\frac{1}{3}$ in the head. This specimen is more robust than those from other localities. Hawkstone; Gravenhurst; Bala; Katrine; Trout Creek; Chapleau; Lizard Islands.

CYPRINIDÆ.

Hybognathus nuchale (Agassiz). Silvery Minnow.

Color dark; sides with a prominent dark band, its anterior portion diffuse; a dark vertebral stripe; no caudal spot; specimens robust. Very abundant at Hawkstone; one specimen from Bala. This is the most northern known range for this species. Its most southern range is North Carolina and Texas.

Chrosomus erythrogaster (Rafinesque). Red-bellied Dace.

The average size of the specimens of this species taken in Ontario is small, few specimens reaching a length of 2 inches. Though taken in the spring their color was not so brilliant as that of those taken in Illinois and Missouri. It inhabits clear streams. Abundant where found. Hawkstone; Bala; Trout Creek.

Pimephales promelas (Rafinesque). Flat-head Minnow.

Color very dark; common. Hawkstone; Trout Creek.

***Pimephales notatus* (Rafinésque).** Blunt-nosed Minnow.

More abundant than the preceding. At Bala this species is used by anglers for bait. Hawkstone; Orillia; Bala; Trout Creek; Sault Ste. Marie.

***Abramis crysoleucas* (Mitchell).** Roach; Golden Shiner.

Abundant at Gravenhurst; one small specimen taken at Bala.

***Notropis heterodon* (Cope).**

A few specimens of this species were taken at Sault Ste. Marie; none were taken in Ontario.

***Notropis cayuga* Meek.**

A few specimens taken with the preceding at Sault Ste. Marie.

***Notropis muskoka* Meek.**

This species is very abundant in Ontario, where it seems to replace the two preceding species. The specimens taken at Bala are darker than those from the other localities. This fish resembles *Notropis cayuga*, but is at once distinguished by its more slender body and the more crowded scales before the dorsal fin. Hawkstone; Orillia; Gravenhurst; Bala.

***Notropis hudsonius* (DeWitt Clinton).** Black-tailed Shiner.

Specimens of this species from Bala are very dark in color. Abundant where found. Hawkstone; Orillia; Bala.

***Notropis cornutus* (Mitchill).** Shiner.

One small specimen from Lizard Islands. Abundant elsewhere where found. Scales before the dorsal fin about 23. Gravenhurst; Trout Creek; Sault Ste. Marie; Lizard Islands.

***Notropis atherinoides* (Rafinesque).**

One specimen from Orillia $3\frac{3}{8}$ inches in length. The color of this specimen is very dark and the lateral band is broader and darker than is usual in this species. The snout is also blunter. Orillia.

***Semotilus atromaculatus* (Mitchill).** Creek Chub.

Very abundant; some of the specimens $9\frac{1}{2}$ inches in length. Hawkstone; Gravenhurst; Bala; Trout Creek; Lizard Islands.

Leuciscus neogæus (Cope).

Ten specimens of this species were taken at Hawkstone.

Rhinichthys atronasmus (Mitchill). Black-nosed Dace.

Common at Hawkstone. Three specimens were also taken at Sault Ste. Marie.

Rhinichthys cataractæ (C. & V.). Long-nosed Dace.

Less common than the preceding. Hawkstone; Sault Ste. Marie.

SALMONIDÆ.

Coregonus quadrilateralis (Richardson). Menominee.

A very abundant species at Sault Ste. Marie and the Lizard Islands.

Coregonus clupeiformis (Mitchill). Common Whitefish.

This species is very abundant at the Lizard Islands, where it is taken in large numbers for the market.

Two specimens, which we identify with some doubt as this species, were taken at Chapleau. On these specimens we made the following notes: Head $4\frac{1}{4}$; depth $3\frac{1}{3}$; D. 10 or 11; A. 10 or 11; scales 11-80-9; eye large, its diameter $4\frac{1}{2}$ in the head; snout 4; maxillary $3\frac{2}{3}$; length of supplemental maxillary twice its greatest depth; gill-rakers 25 or 26; distance from tip of snout to nape 3 in distance from tip of snout to the origin of the dorsal fin; dorsal fin high, its longest rays $1\frac{3}{10}$ in the length of the head; length of pectorals about the same; ventrals a little shorter. Body much compressed; shoulders with a moderate hump, mouth moderate, the tip of the maxillary reaching vertical from anterior margin of the eye; end of mandible reaching slightly past vertical from middle of eye.

Color very dark, the fins being nearly black. These specimens differ from the typical *C. clupeiformis* in having longer head, larger eye, larger scales, deeper body, and a much darker color. Two specimens each 15 inches in length.

This fish is reported as being very common at Chapleau. It, with the pickerel (*L. lucius*) and the yellow perch (*P. flavescens*), comprise the native food-fishes of this region.

Salvelinus fontinalis (Mitchill). Brook Trout.

We collected a few specimens of this species in Trout Creek and at Sault Ste. Marie. It is widely distributed over Ontario, but is usually confined to the streams. Specimens are occasionally taken in Muskoka Lake.

Salmo irideus Gibbons. Rainbow Trout.

This species is introduced into streams of Michigan. A large number of eggs are hatched each year at Sault Ste. Marie.

LUCIIDÆ.

Lucius lucius (Linnæus). Common Pike; Pickerel.

This species is known as pike in Ontario. The pickerel of that region is *Stizostedion vitreum*. It is not found in Muskoka Lake nor in Gull Lake. It is reported as common down the river below the second falls about 4 miles below Bala. The muskallunge comes up the river within 8 miles of Bala. Rock bass and big-mouthed black bass are reported to be in the river from 6 to 8 miles below Bala.

At Chapleau this species was very abundant. In trolling a distance of about 3 miles around a small lake we caught 36 fish about 15 to 19 inches in length. There are no black bass or wall-eyed pike in the lake at Chapleau, and so this species, together with the whitefish found here, is depended upon to furnish sport for the angler and fresh fish for the inhabitants.

We saw none of this species except at Chapleau.

UMBRIDÆ.

Umbra limi (Kirtland). Mud Minnow.

One specimen taken at Gravenhurst. Common in bayous of a small creek near Bala.

PÆCILIIDÆ.

Fundulus diaphanus menona (Jordan & Copeland).

Cross bars 14 to 17; scales about 48; dorsal fin with a narrow black bar on its lower half; a black spot at base, and another at tip of last rays; common. Orillia.

GASTEROSTEIDÆ.

Eucalia inconstans (Kirtland). Brook Stickleback.

Of 38 specimens from Trout Creek, one has 4 dorsal spines, 35 have 5, and 2 have 8 spines. Seven specimens from Sault Ste. Marie each with 5 dorsal spines.

Pygosteus pungitus (Linnæus). Nine-spined Stickleback.

Twenty-three specimens from Trout Creek; 3 have 8 dorsal spines, 11 have 9, and 9 have 10. Two specimens from Chapleau, one with 8, the other with 9 dorsal spines; one, a female, contained large eggs.

PERCOPSIDÆ.

Percopsis guttatus Agassiz. Trout Perch.

Very abundant at Hawkstone.

CENTRARCHIDÆ.

Ambloplites rupestris (Rafinesque). Rock Bass.

This species does not occur in the lakes on the Highlands of Ontario. It comes up the river to within about 8 miles of Bala. Common at Orillia and Sault Ste. Marie.

Eupomotis gibbosus (Linnæus). Pumpkin Seed.

This is the most abundant sun-fish in Ontario. It is found in most of the lakes and streams. Taken by us as follows: Orillia; Gravenhurst; Bala; Katrine; Trout Creek; Sault Ste. Marie.

Micropterus dolomieu Lacépède. Small-mouthed Black Bass.

Very abundant in Gull and Muskoka lakes. It and the wall-eyed pike are the popular fish for anglers who visit this region. The large-mouthed black bass is not known in these lakes. Gravenhurst; Bala.

PERCIDÆ.

Perca flavescens (Mitchill). Yellow Perch.

This is the most common spiny-rayed fish in Ontario. Taken by us as follows: Hawkstone; Orillia; Gravenhurst; Bala; Katrine; Chapleau; Sault Ste. Marie.

Stizostedion vitreum (Mitchill). Wall-eyed Pike.

This species is wrongly called pickerel in Ontario. It is abundant in Muskoka Lake, also in Lake Nipissing at North Bay. It is said to reach a weight of 8 or 9 pounds. Not taken at Chapleau, and not found in Gull Lake, which is less than a mile from Muskoka Lake, into which it drains, though about 60 feet higher. Bala; North Bay; Sault Ste. Marie.

Percina caprodes (Rafinesque). Log Perch.

Sides with 9 or 10 cross bands with half bands between them; on the caudal peduncle some of the bands become dark ovate blotches with the long axis vertical. Dorsal spines 14 or 15, soft rays 15 or 16. Hawkstone; Orillia; Bala; Sault Ste. Marie.

Boleosoma nigrum (Rafinesque). Johnny Darter.

A few specimens were taken at Sault Ste. Marie.

Etheostoma boreale (Jordan). Northern Darter.

This species is widely distributed over Eastern Canada. It is the only darter so far known from the Hudson Bay drainage east of the Saskatchewan. The three darters listed here are the only ones so far known from Ontario. Orillia; Bala; Chapleau.

COTTIDÆ.

Cottus icталops (Rafinesque). Blob.

Dorsal spine 7 or 8, soft rays 16 to 18; the formula usually VII-17. Anal rays 10 to 13. A few small specimens from the Lizard Islands. Abundant at Sault Ste. Marie. It is much used here as bait for black bass.

Uranidea franklini (Agassiz).

Found with the preceding and about equally abundant. Spinous dorsal much lower than the soft; the dorsals scarcely joined; pectorals large, their tips reaching to front of anal. Dorsal VI to VIII-16 or 17. Anal 11 to 13, usually 11. These specimens are very robust. Sault Ste. Marie; Lizard Islands.

GADIDÆ.

Lota maculosa (Le Sueur). Ling.

A few small specimens were taken at Chapleau, where the fish is said to be very common.

BATRACHIA.

AMBLYSTOMIDÆ.

Amblystoma jeffersonianum (Green). Jefferson's Salamander.
Two specimens from Trout Creek.

PLETHODONTIDÆ.

Plethodon cinerus (Green). Ashy Salamander; Red-backed Salamander.
Five specimens from Trout Creek.

SALAMANDRIDÆ.

Diemictylus viridescens Rafinesque. Newt.
One specimen from Gravenhurst.

BUFONIDÆ.

Bufo lentiginosus Shaw. Toad.
Abundant. Hawkstone; Orillia; Gravenhurst; Bala; Katrine; Trout Creek; Chapleau.

HYLIDÆ.

Hyla pickeringii (Storer). Tree Frog.
Scarce. Gravenhurst; Trout Creek.

RANIDÆ.

Rana pipiens Gmelin. Leopard Frog.
Very abundant. Spots usually small and in more than two rows. Hawkstone; Orillia; Gravenhurst; Bala.

Rana palustris Le Conte. Swamp Frog.
Four specimens of this species were taken at Chapleau. The dermal folds are especially large. The quadrate spots on the back between the two dorsal folds are large, in some cases several are run together forming a longitudinal dorsal band; bars on arms and legs very broad.

Rana clamata Daudin. Green Frog.

Very abundant. Hawkstone; Gravenhurst; Bala; Trout Creek.

Rana catesbiana Shaw. Bull Frog.

Abundant. Hawkstone; Gravenhurst; Bala; Trout Creek.

Rana cantabrigdensis Baird. Cambridge Frog; Wood Frog.

Common at Gravenhurst; one specimen taken at Chapleau.

OPHIDIA.

COLUBRIDÆ.

Cyclophis vernalis (De Kay). Smooth Green Snake.

Gravenhurst, one specimen; scales 15-123-80.

Storeria occipitomaculata (Storer). Storer's Snake.

Gravenhurst, two specimens; scales 17-124-48 and 15-121-46.

Natrix sipedon (Linnaeus). Water Snake.

One specimen; scales 21-150-77. Bala.

Thamnophis sirtalis (Linnaeus). Garter Snake; Striped Snake.

One specimen; scales 19-160-65; stripes faint; lower stripe on first $2\frac{1}{2}$ rows of scales. Trout Creek.



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